UTILITY PATENT APPLICATION TRANSMITTAL

(for Noncontinuing, Nonprovisional
Applications under 37 C.F.R. §1.53(b))

Attorney Docket No. 66610

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Sir:

Transmitted herewith for filing
under 37 C.F.R. §1.53(b) is the
nonprovisional, noncontinuing
patent application for:

Title: METHOD AND APPARATUS FOR REMOTE
       AUDIOVISUAL SIGNAL RECORDING SERVICE

First Named Inventor or
Application Identifier:
        Adam W. FINGERMAN et al.

(X)   __28__ pages of the specification (including claims) are enclosed.

(X)   __13__ sheet(s) of drawings are enclosed.   ( ) Formal   ( ) Informal

( )   An executed Oath or Declaration and Power of Attorney naming the
       actual inventors is enclosed.

(X)   The names of persons believed to be the actual inventors are set forth
       in the enclosed unexecuted Oath or Declaration and Power of Attorney
       (§1.41(a) and §1.53(b)).

( )   An Assignment(s) of the invention to _____,
       and cover sheet are enclosed.

( )   A check in the amount of $_____ to cover the fee for recording the
       assignment(s) is enclosed.

( )   A 37 C.F.R. §3.73(b) Statement is enclosed (where an Assignee seeks
       to take action in a matter before the Patent Office).

( )   An Information Disclosure Statement is enclosed.

       ( ) A Form PTO-1449 is enclosed.

       ( ) _____ References (copies) listed on the Form PTO-1449 are
            enclosed.

(X)   A Return Receipt Postcard is enclosed (MPEP §503).

Noncontinuing Utility §1.53(b)-1-699

( )   Priority of application number ___/_____ filed on
_____ in _____ is claimed under
35 U.S.C. §119.

    ( )   A certified copy of the priority document is enclosed.

( )   A MicroFiche Computer Program (Appendix) is enclosed.

( )   A Nucleotide and/or Amino Acid Sequence Submission is enclosed.

    ( )   A Computer Readable Copy is enclosed.

    ( )   A Paper Copy (Identical to Computer Copy) is enclosed.

    ( )   A Statement Verifying Identity of above Copies is enclosed.

(X)   The filing fee is calculated below:

<div align="center">Fee Calculation For Claims As Filed</div>

(a) Basic Fee $ 760.00

(b) Independent Claims ___5___ - 3 =_2_ x $ 78.00 = $ **Deferred**

(c) Total Claims   _33_ - 20 = 13_ x $ 18.00 = $ **Deferred**

(d) Fee for Multiply Dependent Claims $260.00 $_____0__

                                 Total Filing Fee $ ***Deferred**

( )   A Statement(s) of Status as Small Entity is
enclosed, reducing the Filing Fee by half to: $_____

( )   A check in the amount of $_____ to cover the filing fee is
enclosed.

( )   Charge $_____ to Deposit Account No. 06-1135.

(X)   ***The payment of the Filing Fee is to be deferred until the Declaration
is filed. Do not charge our Deposit Account.**

(X)   A separate written request under 37 C.F.R. §1.136(a)(3), which is
a general authorization to treat any concurrent or future reply
requiring a petition for an extension of time under 37 C.F.R.
§1.136(a) for its timely submission as incorporating a petition
for an extension of time for the appropriate length of time, is
enclosed.

(X)   The Commissioner is hereby authorized to charge any additional fees
which may be required in this application under 37 C.F.R. §§1.16-1.17
during its entire pendency, or credit any overpayment, to Deposit
Account No. 06-1135. Should no proper payment be enclosed herewith,
as by a check being in the wrong amount, unsigned, post-dated, other-
wise improper or informal or even entirely missing, the Commissioner
is authorized to charge the unpaid amount to Deposit Account No.
06-1135. This sheet is filed in triplicate.

( )   Also enclosed:
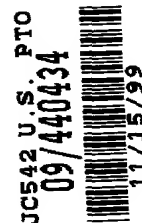
(X)   Address all future communications to Customer Number 22242.

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FITCH, EVEN, TABIN & FLANNERY
Suite 1600
120 South LaSalle Street
Chicago, Illinois   60603-3406
Telephone: (312)   577-7000
Facsimile: (312)   577-7007

<u>   November 15, 1999   </u>
(Date)

Kenneth H. Samples
Registration No.   <u>25,747</u>

Noncontinuing Utility §1.53(b)-3-699

METHOD AND APPARATUS FOR REMOTE
AUDIOVISUAL SIGNAL RECORDING SERVICE

Background of the Invention

This invention relates to the delivery of multi-media signals such as television to clients via computer networks such as the Internet. More particularly, the invention relates to methods and apparatus for

5   selectively receiving time scheduled signals from a plurality of sources and at the request of a client, for delivering representations of the requested signals to the client.

In the course of the following description,

10 television signals are mentioned as a most common example but the media program signals could be any media signals such as broadcast AM or FM, television or any other signals desired by a client. Also, the term "time scheduled signals" is employed to mean any type of

15 signal the presentation time of which is known but the time of presentation is not generally controlled by the provider of services herein. Such time scheduled signals may include, broadcast television, broadcast FM, cable television and FM, satellite television and FM

20 signals and closed circuit presentations.

The modern television and FM user has a wide array of possible signal sources available from which to choose. Such sources include standard broadcast television, cable network and satellite systems of many

25 varieties. Each of these systems and others not named require a different type of receiver/decoder and most users have only one or two types of service which they can actually receive. Economically, the user cannot afford to have access to all or even most of the sources

30 of media programming. Further, even when a person can afford to own all of the equipment, much of it will be seldom used and thus not an economic value.

Cable television systems are an attempt to provide full media coverage to households by sharing the costs of receiving many types of signals and delivering those signals to users in a standard format. Although the

5 costs of a cable system can be shared by many users, the bandwidth available for cable revenue is limited so the cable service providers decide on a general basis which media channels will be available to their subscribers. Thus the range of available programs is limited. What

10 is needed in the art is a media delivery system which has shared usage so that many types of signal source formats can be afforded while permitting individual users to specifically request which media programs they want to receive at any given time.

15 Such a shared media program reception method and apparatus satisfies other needs in the art. Video tape recorders (VTR), which are often video cassette recorders (VCR), are common today and are present in many if not most households. The VTR itself includes

20 many complex mechanical and electrical functions and is subject to many types of well-known failures. Without a back-up VTR at the user's home, a failure may prevent recording a desired program. With a VTR, a viewer can record from broadcast media and play the recording back

25 at a later time. Although most modern VTRs enable some rather sophisticated procedures for recording selected future programs, it appears from the popular press that most households are not capable of using those procedures. The most common use of the VTR is to

30 manually turn on the recording function at the time the program to be recorded is airing or to play pre-recorded tapes. Systems such as VCR+ have been developed which simplify the operation needed for recording future programs but these normally add cost to the recording

35 system and are still too complicated for use in many households. The result is that consumers have not

achieved the television viewing freedom they might if recording were less expensive and easier to perform.

Recently, products such as TiVo of Sunnyvale, California (www.TiVo.com) and Replay TV of Mountain View, California (www.ReplayTV.Com) have come into the market, providing a new way of recording broadcast programming at the viewer's location. These products, which are called home hard drive systems herein, use a "set-top box" at the viewer's premises to receive video programs available to the consumer and to store related ones of the available programs. Storage occurs on a high capacity hard disk drive located inside the set-top box. Such a home hard drive system may cost from $500 to $1,500 at this writing and like VTRs, they are subject to mechanical and electrical failures which can leave the consumer without a means of recording a desired program. Further, the video programs in many homes are delivered through cable TV receivers/decoders and/or direct satellite TV receivers/decoders. In order to properly store video programs from such receiver/decoders, the home hard drive systems must control the operation of the separate receivers/decoders. Otherwise, the receivers/decoders would not be turned on to the proper signal source when needed. Such control is usually exercised by the transmission of infrared control signals from the home hard drive system, however, training the home hard drive system to perform such tasks may be difficult and may also be subject to failures.

Another problem of the home hard drive systems, is that like VTRs, storage is at the viewer's premises and is limited to storage of programs which are already available at the consumer's premises. Lastly, the home hard drive systems contain a fixed amount of storage, and, should more storage be needed, such can be added only by expensive and complex replacement and/or augmentation of their high capacity disk drive.

What is needed in the art is an improved broadcast media recording system which avoids per viewing device storage equipment and which provides a simplified human/machine interface to access media programs
5 available in different geographic locations from the viewer's location.

Summary of the Invention
A system and method in accordance with the present invention provides broadcast media recording and/or
10 delivery without per viewer location recording media and in so doing avoids the costs and complexity of prior systems. The control of the recording event and the delivery of the media is performed over a computer network such as the well known Internet.
15 The aforementioned problems are solved and an advance is achieved in accordance with the invention which is a method and apparatus for receiving time scheduled media programs and in response to a request from a client which is remote from the program
20 reception, selecting a specified media program and delivering the selected program to the client via a digital network such as the Internet. An embodiment of the invention includes plurality of a delivery systems each connected to a plurality of media program sources
25 and to one or more clients via the Internet. The media program sources may include cable television systems, satellite transmission systems, CCTV or other sources of media programming. With this wide array of media sources the client has access to ordinary television
30 programming such as soap operas, movies and broadcast sporting events, and to more esoteric media programming such as corporate board meetings or instructional medical procedure programs via CCTV. The plurality delivery systems may advantageously be at geographically
35 separated locations and have access to different media program sources than are available at a client's

premises. In accordance with an embodiment a client may select or be otherwise assigned a preferred geographic location from which to select media programs, however, the client also has access to media program signals

5   available at other locations.

In an embodiment, the client contacts a client server of the media reception and delivery system via the Internet and specifies which media program he or she would like to receive as well as a streaming video

10   format and data rate at which the program should be sent to the client. The client server validates the client request and advises a scheduler portion of the delivery system of the desired program and the delivery format and data rate. The scheduler allocates a receiver to

15   receive the specified media program and an encoder to convert the received program into requested video format. The scheduler begins the receiving and encoding at a time just prior to the scheduled "airing" of the requested media program.

20   The reception and delivery system of an embodiment may be distributed to a wide variety of geographic locations so that a client may contact a client server in one location to control the storage of multimedia signals in another location. For example, a client in

25   Chicago can submit a request for storage of a broadcast television cricket match in India. A reception and delivery system in India can respond to the request by storing the requested cricket match and distributing it to the client. Thus the client has an opportunity to

30   record, view, and/or play back programs not normally accessible to the client.

The client server of an advantageous embodiment stores media program schedules for each of the distributed reception and delivery systems around the

35   world. A client may be assigned a preferred program schedule or listing which shows the media programs available at one of the distributed reception and

delivery systems. The client, however, has access to the schedules of the other reception and delivery systems. In one embodiment the client is presented with its preferred listing and is given the opportunity to

5 select and view the listings of other locations from which storage choices may be made. A search tool is also available at the client server into which the client can enter media program keywords. The search tool searches the listings of the preferred and other

10 available listings to create and present to the client a list of media programs matching the key words. The created and presented list may well include media programs available at a plurality of geographical locations from which the client can choose media

15 programs for storage.

The encoded media program is stored by the delivery in digital format in a high speed-high capacity store. When the scheduled time for completion of the requested media program occurs, the reception and encoding stops

20 and the delivery system prepares and sends an electronic mail (e-mail) message to the client identifying one of a plurality of program delivery devices and the address of the file storing the digitized media program. Advantageously, the e-mail to the client includes a URL

25 which identifies both the delivery device and the file address. When the client wishes to receive the stored program he or she transmits on the Internet the URL obtained from the delivery system e-mail. The delivery device of the delivery system responds to the URL by

30 reading the media program from storage and transmitting it to the client over the Internet in the format requested by the client.

The client server maintains a file for each client which identifies, among other things, a value

35 representing an amount of storage allocated to the client. When storage is used the client server subtracts the amount used from the allocated amount and, should the

client request more storage than allocated, the system
may refuse the storage request and/or offer the client
additional storage amounts. From time to time the client
server may advise the client that a previously requested
5   stored media program is about to expire. Such advice may
also include an option to extend the expiration date of
the subject stored media program.

Brief Description of the Drawings

10   A more complete understanding of the invention may
be obtained from consideration of the following
description in conjunction with the drawing, in which:
         FIG. 1 is a block diagram of Internet connected and
geographically distributed apparatus for media program
15   storage and delivery to clients;
         FIG. 2 is a block diagram of a delivery system shown
in FIG. 1;
         FIG. 3 represents a video screen presented to a
client during membership sign-up;
20   FIG. 4 represents a video screen presented to a
client for requesting delivery of a specific media
program;
         FIG. 5 represents a video screen presented to a
client during program selection;
25   FIG. 6 represents a video screen presented to a
client to announce storage of a requested program;
         FIG. 7 represents a video screen of program
presentation to a client;
         FIG. 8 represents a video screen warning a client of
30   imminent program erasure;
         FIG. 9 represents a video screen notifying a client
of the status of available storage;
         FIG. 10 is a flow diagram of the operation of a
client server and media delivery system of FIG. 1;
35   FIG. 11 is a flow diagram of a media delivery system
during program storage;

FIG. 12 represents a screen delivered to a client requesting more storage than allocated to that client; and

FIG. 13 is a block diagram of a system for median
5   program reception and storage.

Detailed Description

U.S. Patent Application Serial No. _____, which is assigned to the assignee of the present application and filed on even date herewith, discloses a
10   related method and apparatus and the contents of that application are hereby incorporated herein by reference.

FIG. 1 shows a system for accepting requests for recording and/or presentation of media programming from a plurality of clients 11, 13, 15 and 16 and for delivering
15   media programming to those clients. The emphasis in this description is on the delivery of video programs such as television, however, it must be kept in mind that the media programs delivered may be audio or video and that the video programs may include an audio portion. In FIG.
20   1, client 11 is connected to the Internet 17 via an analog modem and has a maximum data throughput of 56K bps. Client 13 is connected to the internet via an XDSL connection and has a data throughput of approximately 6M bps and client 15 is connected via a LAN and has a data
25   throughput of 10 to 100 M bps. Lastly, client 16 is connected to the Internet via a cable modem. Although the Internet is used as a communication device in the present embodiment, the present method and apparatus could operate with any type of digital network.
30   The clients 11, 13, 15 and 16, which represent a large number of possible clients, are connectable via the Internet 17 to a client server 49 and a plurality of media delivery systems 50a-50d. Each of the delivery systems may be located in a different geographic area
35   than the others and receive media programs such as satellite signals 31a and 31b, cable TV service 33,

broadcast TV 35 and CCTV 37. The delivery systems may be located, for example, in all major metropolitan markets around the world. That is, delivery systems provide media program access in, for example, New York, Chicago,

5   Denver, Los Angeles and Honolulu in the U.S., as well as many major metropolitan markets around the world. Thus, the client has access to different time zones and media programs in the U.S. and may also access media programs from Helsinki, Paris, Rome, Tokyo, Rio de Janeiro and

10   many other equipped cities. The client server 49 is accessed by the URL of overall system of FIG. 1 and implements initial client-system interaction with the remainder of the FIG. 1 system. In the present embodiment the clients contact client server 49 to

15   establish membership and to place their requests for media program recording. The client server validates new membership and client accesses and also forwards requests for media program storage to selected delivery systems capable of recording requested programs.

20   Client server 49 maintains a schedule or listing of the media programs available at each of the delivery systems 50a-50d. The client server, upon receiving a request for storage of a specified media program from a client, identifies from its schedule of media programs

25   one of the delivery systems 50a-50d which has access to the specified program. The client server 49 then forwards data such as data rate, video format and e-mail address of the client to a scheduler 20 the identified delivery system, e.g. 50a. FIG. 2 is a block diagram of

30   delivery system 50a which also represents delivery systems 50b, 50c, and 50d, which are substantially similar. A scheduler 20 of delivery system 50a receives the message from the client server 49.

Scheduler 20 responds to the message by overseeing

35   the operations of the delivery system 50a to receive a specified media program and make it available to the clients. Scheduler 20 maintains current and future

information regarding the schedule of media programs available on the various media sources, e.g. 31a-37 and their times of availability. The primary sources of such scheduling information can be accessed via the Internet
5   17 which is available on connection 22.

When a media program requested by a client is playing or is about to play, scheduler 20 connects the signal source conveying the program to a receiver/decoder such as receiver/decoder 53 which is appropriate for the
10 signal source to produce a standard base band signal of the selected media program. As is shown in FIG. 2, a plurality of receiver/decoders 53-69 is present in the embodiment. For example, if a channel X from satellite 31a is to be made available to a client, e.g. 15,
15 scheduler 20 transmits a connection request to a multiswitch such as multiswitch 80, to connect the source signals from satellite 31a to a specified receiver/decoder, e.g. 55, for signals from that satellite. Multiswitch 80 responds to the request by
20 connecting the signals to the specified receiver/decoder, e.g. 55. At the same time, scheduler 20 sends a receiver/decoder command to a receiver controller 91 specifying that channel X is to be converted by receiver 55 into base band. In the present embodiment, each
25 receiver/decoder, e.g. 55, can produce a base band output signal for one video channel at a time. Accordingly, a delivery system for simultaneous delivery and/or recording of 200 video channels would include at least 200 receivers/decoders. The receiver controller 91 is
30 connected to all of the receivers/decoders 53-69, and transmits to them the necessary parameters to receive and/or decode the signals from the specified source, e.g. 31a, into video base band. The operation of such digitally controlled receivers/decoders is well known and
35 not described in detail.

The video base band output signals of each receiver/decoder, 53-69, are connected to a predetermined

one of a plurality of video digitizers 23a through 23n.
The video digitizers of the present embodiment are 450
MHZ Pentium II NT work stations and which are each
connected to three base band video signal inputs from the

5   receiver/decoders. In other embodiments, the digitizers
may be less capable and perhaps be connected to only a
single receiver/decoder. Similarly, more capable video
digitizers may be connected to more than three
receiver/decoders.

10   Each video digitizer comprises a high capacity
processor 95 and a high capacity storage device 97, such
as the Sun Solaris box storage array 5000. The
processor, e.g. 95, receives each of the incoming base
band video signals from its connected receiver/decoders,

15 e.g. 53, 55 and 57, and converts each received signal
into an uncompressed AVI format. The uncompressed AVI is
then converted into a format specified by a client in the
original request from the client. The converted
video/audio signal is then stored in a file on storage

20 device 97 for replay to the requesting client. It should
be mentioned that actions by the processor 95 occur in
response to directions from the scheduler 20.

Delivery system 50 also includes a plurality of
playback servers of which playback servers 101, 103 and

25 105 are shown in FIG. 2. Each playback server has one or
more Internet addresses and is connected to retrieve
stored files from the high capacity stores, e.g. 97, of
all of the video digitizers, e.g. 23. The software
control of the playback server responds to requests from

30 clients for a particular URL including a file identity by
retrieving the video represented by the URL from a
predetermined high capacity store and transmitting
streaming video derived from the video file to a
requesting client. The high capacity store storing each

35 recorded video program is identified to the playback
servers 100, 103 and 105 by the scheduler 20 as is the
address of the particular file.

Advantageously, the playback to a client occurs in one of the streaming video format which the client can receive. When a client first requests a media program from request server 49, the desired streaming video

5   format is specified with the request. The scheduler 20, in response to the request information, identifies the requested playback format to the video digitizer selected to record the video program. The video digitizer then converts the uncompressed AVI of the video program into

10   the requested format before storage in a high capacity store.

In the present embodiment, a client must become a service member prior to making requests for media delivery. Such membership allows the delivery system to

15   record certain default parameters for media selection and delivery and allows the delivery system to establish a method of payment for services, if such is desired. In other embodiments such memberships may not be required and the client may merely contact the client server 49

20   and request media delivery and/or storage.

A client, e.g. 15, may contact the client server 49 at any time using a widely distributed URL to the service provider's home page. When a client contacts the client server 49 (step 501 FIG. 10) prior to becoming a member,

25   a step 505 is performed to identify if the client is a non-member and a screen is presented (step 537) to the client asking whether the non-member client would like to become a member. If so, the client is presented with a screen of information boxes as shown in FIG. 3, a portion

30   of which may constitute terms and conditions of membership (not shown). The client, after viewing the terms and conditions, enters his or her name and address into boxes 107 and his or her e-mail address into a text box 101. In the present embodiment a client's electronic

35   mail (e-mail) address is used as a log-in name for services, however, other embodiments may include a separate new text box for a separate log-in name. The

client then enters in a text box 103 a password for later
permission to use the service and confirms the password
by retyping it in a confirmation box 105. The client
also enters his or her connect type such as XDSL in a
5   text box 109 and connect speed, e.g. 6 M bps in box 111.
The client further specifies in a text box 112 the video
format he or she would like to use to receive later
requested signals. The client also enters payment
information such as a credit card number in text box 113
10   and a PIN for use with the credit card in box 115. The
client also selects by means of a drop down menu 102 a
listing for a preferred geographical location which
represents the delivery system to which the client will
most frequently refer. In FIG. 3 the client has selected
15   the geographical location "New York" in menu 102 to
identify the listing of programs available at a New York
delivery system. As a part of membership, the client
also requests a particular grade of service and base
storage duration by entering text in boxes 118 and 119.
20   Table I is an illustrative example of a grade of
service/storage duration pricing schedule which is
intended merely to be illustrative.

Hours	Medium Grade	High Grade
2 hours	Free	$14.95
4 hours	$ 9.95	24.95
6 hours	14.95	29.95
1 hour per use	$ 1.95	$ 3.95
1 week extension	$ 1.95 per program	

TABLE I

30   In the schedule of Table I, medium grade represents the
storage required to deliver media programs at 100 kbps
and high grade represents the storage required to

delivery media programs at 190 kbps. The storage duration and grade of service information is stored in a client identifiable file and used by the client server 49 in a manner discussed below to allocate resources to the

5   client. After the boxes of the screen represented by FIG. 3 are filled in, the client clicks an accept button 117 and the information is sent to the client server 49 as membership data. Client server 49 validates the data in a step 541 and stores necessary parameters in a client

10   membership file in a step 543. After information validation, the client server 49 returns a "thank you new member"screen to the client. The client server also sets a cookie (step 545) on the client computer to show that membership permission has been granted to the client.

15   A client who is a member is free to enter the URL of the client server 49 and be connected by the Internet to the client server 49 which will recognize the member status. Upon recognizing that the client is a member by entry of the client's password, and checking the client's

20   cookie, the client server returns a program request screen (step 507 FIG. 10) to the client. Such a request screen, as is shown in FIG. 4, is used by the client to request a specific media program or programs for delivery to the client. FIG. 4 includes a schedule listing

25   portion 201 which identifies programs available to the client for storage. Initially, the schedule presented is for the preferred location, e.g., New York, which was selected during membership. The screen shown in FIG. 4 is for the network broadcast television programs

30   available from 7:00 to 10:00 P.M. August 18, which is identified by pull-down menu boxes 202, 203 and 204 respectively. Should the client want a different source, time, or date, the pull-down menu box data can be changed in the known manner and a TV listings button 205 clicked.

35   Clicking the button 205 sends the new source, time and date information from boxes 202, 203 and 204 to the client server 49, which responds with an updated screen

to show the new source, date and time listing. The source menu allows the client to view broadcast TV, regular cable, premium cable, pay-per-view, satellite listings or a combined listing of all categories. Should

5 the client not want to record a program from the New York listing, a pull-down menu 207 may be updated with a new location, such as Chicago or Paris, and the TV listings button clicked. The new location listing data from menu 207 will be sent to the client server 49 which will

10 respond by sending a new listing screen showing the media program listings for the selected location.

　　　　After the desired listing is presented at location 201 the client can click an entry of interest and press the full listing button 209. The client server 49 will

15 respond by presenting a full listing of the selected program as shown in FIG. 5. The client can request storage of the selected program by pressing a record button 210 (FIG. 5) or can return to the listing of FIG. 4 by pressing a return button 211. The client may also

20 select a program from the listing 201 and press the record button 217 (FIG. 4). The data representing the client's selection is then sent to the client server 49 which identifies an appropriate delivery system, e.g. 50a, and forwards a storage request to the scheduler 20

25 of the selected delivery system.

　　　　Should a client request storage of a media program the broadcast of which has already begun, the client server 49 will search listings for other locations to determine if the selected program has yet to be broadcast

30 at another location. For example, if the client after 7:30 P.M. requests storage of the television program "Frasier" at 7:30 P.M. on WPIX in the New York listing, the client server 49 will check other listings such as, for example, Los Angeles, to determine if the selected

35 "Frasier" program will be available there at a later time. If so, client server 49 will notify the delivery system 50 in the determined, e.g., Los Angeles, location

to receive and store the requested program when
broadcast.

A search tool 208 is also available to identify
accessible media programs should the client not want to
browse listings such as 201. With the search tool,
keywords are entered into a text portion and a search
button is clicked to send the keywords to the client
server for a search of all available location data bases.
For example, a client may enter the text "hockey" into
the search tool 208 and click the search button. The
client server searches all of its available program
listings for matches with the word hockey. The results
(not shown) are then presented as a list, in the nature
of a list created by a search engine, for review and
selection by the client. The results of such a selection
are sent to the client server 49 and used to implement
program storage as discussed herein.

The selection screen of FIG. 4 also includes a genre
drop-down menu 206 which permits a client to select a
genre for which to receive a listing for program
selections. The genre may include easy listening music,
sports, movie comedy, movie action, or other categories.
The contents of a genre is produced by the client server
as a composite of all of the listings available to the
recording system.

Upon receipt of a program storage request in step
509 (FIG. 5) the client server 49 forwards (step 511) to
the scheduler 20 of the selected delivery system the
identity of the program to be stored, the identity
(e-mail address) of the requesting client, the data rate
of the client and the type of streaming video delivery
desired by the client. The scheduler 20 analyzes the
information from the client server 49 in a step 513 and
schedules the availability of a receiver/decoder, e.g.
53, and video digitizer, e.g. 23a, during the time that
reception and storage is to take place. A storage
routine is then scheduled in step 515 to execute on the

scheduler 20 at a time just prior to the time at which
storage is to begin, i.e. just prior to the scheduled
start of the requested media program.

Upon execution, the storage routine (FIG. 11)

5   communicates with the devices scheduled to perform the
requested program selection, encoding and storage.
Initially, the scheduler 20 in step 521 transmits data to
a multiswitch 80 a direction to connect the source, e.g.
cable 33, to the decoder/receiver, e.g. 53, previously

10 allocated to the scheduler. At about the same time,
scheduler 20 transmits a command in step 523 to
controller 91 specifying that it is to control
receiver/decoder 53 to convert the channel carrying the
selected program from cable 33 into baseband. The

15 scheduler 20, as a part of the storage routine, also
identifies the client's data rate and streaming media
format to the digitizer 23a and directs in step 525 the
encoding of base band signals from receiver/decoder 53
into uncompressed AVI and conversion of the result into

20 Real Media. The processor 95 of the digitizer 23a then
stores the Real Media data stream as a file on store 97
and identifies the beginning file address to scheduler
20.

The scheduler then begins a timer in step 529 for

25 the storage routine which times out at the scheduled end
of the media program being stored. At time out the
scheduler directs in step 531 the removal of connections
established to receive the requested program and directs
the digitizer 23a to stop the encoding and storage of the

30 program. The storage routine then performs step 533 to
identify a playback server, e.g. 105, to transmit the
stored media program to the client upon the client's
request. In the present example playback server 105 is
identified because it provides streaming video in the

35 Real Media format. Upon identifying the playback server
105, the scheduler 20 produces and sends (step 535) an e-
mail message as shown in FIG. 6 back to client 15 which

message identifies by URL the identified playback server
105 and the file to be accessed. As an example, the URL
might be:

       HTTP://www.TVstorage.net/account=
5   client@TVstorage.com:program=BZD1TRY3

which identifies the playback server and the address of
the media program file.

The client 15 receives the e-mail from the scheduler
and may access the file at a time selected by the client,
10 by entering the URL from the e-mail. The playback server
105 responds to the URL by accessing the Real Media file
stored for client 15 in memory 97 and forwarding that
file to client 15 via the Internet. FIG. 7 represents a
screen on which the stored media program is delivered to
15 the client.

When a client signs up as a member, he or she
specifies the grade of service wanted and an initial
amount of storage to be allocated to the client. In the
examples which follow it is assumed that the client has
20 requested two hours of medium grade service. When a
client requests storage of a program, the client server
49 accesses the client's parameter file and identifies
the amount of storage available. Should the amount of
storage available be less than that needed to store the
25 requested program, the client server 49 does not set up
storage via a delivery system, e.g. 50d, but instead
returns a message to the client such as that shown in
FIG. 12. Should the client click the "buy more" line, a
new screen will be presented offering additional amounts
30 of storage for displayed prices. When the client clicks
an amount to buy more storage a billing event occurs and
a billing parameter of the client is increased by the
displayed price. Further, the amount of memory allocated
to the client is increased by the amount purchased.
35 Should the client not choose to purchase more storage a

message is returned to the client indicating that the
previously requested storage will not take place because
of inadequate storage. When the client has or purchases
enough storage to record a requested program the amount

5   of storage required is subtracted from the client's
allocated storage amount parameter before a delivery
system, e.g. 50d, is instructed to store a requested
program.

Each program stored by a delivery system, e.g. 50d,

10   is automatically erased when viewed and also after the
passage of a predetermined period of time after storage
occurs. For example, if the client has not viewed a
stored program within approximately one week after the
program was stored, the program will "expire" and be

15   erased. To avoid client mistakes, the client server
reviews each client's account periodically and notifies a
client if a stored program is to be erased within one
day. FIG. 8 shows a screen which may be delivered to the
client when a program is about to be erased. The warning

20   screen of FIG. 8 gives the option of watching the program
by clicking a link at 611 and also gives the client the
option 613 of extending the storage period of the subject
program for a fee. Should the client choose to extend
the storage period, his or her account will be debited by

25   the extension fee cost and the expiration period in the
client parameters will be extended by the appropriate
amount of time. On the screen shown in FIG. 8, clicking
the link shown at 613 will add $1.95 to the client's
account and extend the storage period for the identified

30   "Simpsons" program for one week.

From time to time the client server 49 reviews the
status of memory usage for each member client. When a
client having available storage time is identified, the
client may be sent a message as shown in FIG. 9 to remind

35   the client of the programs already in storage and the
amount of unused storage time available. The screen of
FIG. 9 identifies the programs in storage in a col. 603,

the expiration dates of the stored programs in a col. 605
and provides hyperlinks to actions such as watch, extend
and erase (col. 607) for each program. The client can
ignore the message of FIG. 9 or follow one of the
5   possible hyperlinks to other actions.

The preceding embodiments show media program signal
reception and the coding and storage of media programs
being performed by distributed delivery systems, each of
which perform all functions. In an additional embodiment
10   as shown in FIG. 13, the signal reception is shown to be
distributed to receive signals in different geographical
locations and the coding and storage functions also being
distributed but remote from the signal reception. In
FIG. 13 a plurality of clients 11 through 16 are
15   connectable via the Internet 17 to a client server 49.
Also connected to the Internet 17 are a plurality of
storage units 701, 703 and 705. Each of the storage
units is connected to a media program switch 706 as well
as to other sources of media signals (not shown). The
20   storage units 701, 703 and 705 receive media program
signals from switch 706 and, under the control of client
server 49, encode and store media programs requested by
the clients 11-16. Switch 706 operates in response to
commands from client server 49 via the Internet 17 and a
25   connection 715 to connect selected media program signals
from one or more of receivers 707, 709, 711 and 713 to
the storage units 701, 703 and 705. The receivers 708,
709, 711 and 712 are geographically distributed in Rome,
New York, Chicago and Los Angeles in the present example.
30   Client server 49 is aware of the media program signals
available at each of the receivers and can present
listings representing the media programs at each receiver
to the clients 11-16 in the manner previously described.
When client server 49 receives a media program request
35   from a client, it identifies one of the receivers 707,
709, 711 and 713 which receives the requested program and
controls switch 706 to connect the media program signal

to a selected storage unit, e.g. 701. The selected
storage unit, e.g. 701, is also directed to detect,
encode, and store the requested media program signal and
deliver it to the client on request. In the embodiment

5   of FIG. 13, it is not required that the storage units be
in any particular geographic location and may even be in
a single storage center. Additionally, the media program
signal switching functions of switch 706 may be
distributed to a plurality of switches or other types of

10   signal directing units.

It is understood that the above described
embodiments are merely descriptive of the principles of
the invention and that many variations may be devised by
those skilled in the art without departing form the scope

15   of the invention. It is intended that such variations be
included within the scope of the claims.

WHAT IS CLAIMED IS:

1.   A method of media program selection using a
media program storage system having access to a plurality
of media program signals from a plurality of different
5   geographic locations, at least two of the geographic
locations having associated media program listings
representing media programs available at the geographic
location, the method comprising:
        assigning a preferred media program listing to a
10   client of the media program storage system;
        presenting to the client, via a computer network,
the preferred media program listing;
        receiving from the client a request for storage
including the identity of a media program selected by the
15   client; and
        storing the selected media program for the client in
response to the received request.

2.   A method in accordance with claim 1 wherein the
media programs have an associated start time and the
20   method comprises:
        identifying one of the plurality of geographic
locations in which the start time for the requested
program has not yet occurred; and
        storing the selected program from the identified
25   geographic location by a storage unit.

3.   A method in accordance with claim 1 comprising
presenting the client with an opportunity to receive a
media program listing other than the preferred media
program listing.

30   4.   A method in accordance with claim 3 comprising
changing the presented media program listing in response
to a client request to display a media program listing
for a location other than that of the preferred listing.

5.   A method in accordance with claim 1 comprising searching the plurality of media program listings to identify a geographic location having access to a media program requested by the client.

6.   A method in accordance with claim 1 comprising presenting to the client a media program search capability.

7.   A method in accordance with claim 6 comprising receiving media program key words from the client for use by the search capability.

8.   A method in accordance with claim 7 comprising presenting to the client one or more media programs identified by the search capability.

9.   A storage allocation method comprising:
    receiving a request for media program storage services from a client;
    allocating a predetermined amount of client available storage capacity to the client in response to the request;
    receiving a request for storage of an identified media program from the client; and
    storing the identified media program and determining an amount of client available storage capacity remaining after the storage of the identified program.

10.   A method in accordance with claim 9 comprising notifying the client of the amount of remaining client available storage.

11.   A method in accordance with claim 10 comprising offering additional storage capacity to the client.

12. A method in accordance with claim 9 comprising receiving a request for additional storage from the client and in response thereto, allocating additional storage capacity to the client.

5   13. A method in accordance with claim 9 comprising delivering the stored media program from storage to the client and increasing the storage allocated to the client by an amount substantially equal to the storage used to store the stored media program.

10   14. A method in accordance with claim 9 wherein an expiration date is established for the media program stored and the amount of storage capacity used to store the identified media program is made reusable by the client at the passing of the expiration date.

15   15. A method in accordance with claim 14 comprising notifying the client of the expiration date before the passing of the expiration date.

16. A method in accordance with claim 15 comprising offering the client an additional time period of storage
20 for the stored multimedia program.

17. A method in accordance with claim 9 wherein the predetermined amount of client available storage capacity allocated the client is determined by a quality of service level requested by the client and the method
25 comprises assigning a cost to the client based on the allocated amount of storage.

18. A method in accordance with claim 9 wherein the predetermined amount of client available storage capacity allocated to the client is determined by a request for
30 storage capacity from the client and the method comprises

assigning a cost to the client based on the allocated amount of storage.

19. A method in accordance with claim 9 comprising determining the amount of storage needed to store a media
5 program identified by the client and denying storage when the needed amount of storage exceeds the amount of client available storage.

20. A method in accordance with claim 19 comprising offering additional storage capacity to the client.

10 21. A method in accordance with claim 18 wherein the media program storage system includes a plurality of media program storage locations and the method comprises notifying an allocator function of the total amount of storage capacity in use to store media programs requested
15 by the client.

22. A media program storage system comprising:
a plurality of storage units for receiving and storing a predetermined plurality of media program signals, said storage units being located in different
20 geographic locations;
a network accessible server for receiving requests for storage of identified media program signals from network connected clients and in response to a request from a client for notifying one of the plurality of
25 storage units to receive and store the identified media program signal; and
the storage units comprise apparatus responsive to the notifications from the network accessible server for receiving and storing the identified program and for
30 notifying the requesting client of a network address at which to retrieve the stored media program.

23. A media program storage system in accordance with claim 22 comprising apparatus responsive to a delivery request from the client via the network for delivering the stored media program to the client via the network.

24. A media program storage system in accordance with claim 22 wherein the network accessible server stores a value identifying an amount of storage available to the client.

25. A media program storage system in accordance with claim 22 wherein the network accessible server stores a preferred listing of media programs for access by the client.

26. A media program storage system in accordance with claim 25 wherein the network accessible server stores listings of media programs in addition to the preferred listing.

27. A media program storage system comprising:
receiving apparatus for receiving media program signals from a plurality of geographic areas;
a client server for receiving from a client via a computer network a request for storage of an identified one of the media program signals and for directing the connection of the identified media program signal from the receiving apparatus to a storage apparatus, the storage apparatus comprising storage media responsive to the client server for storing the identified media program.

28. A media program storage system in accordance with claim 27 wherein the computer network is the Internet.

29. A media program storage system in accordance with claim 27 wherein the storage media comprises apparatus responsive to a request received from the client via the computer network for transmitting the stored media program to the client via the computer network.

30. A media program storage in accordance with claim 27 wherein the client server stores information identifying the plurality of media program signals.

31. A method of media program storage comprising:
receiving a plurality of media program signals from a plurality of geographically separated locations;
receiving a request for storage of a specified one of the media program signals;
connecting the specified media program signal to a media storage apparatus; and
storing the specified media program signal by the storage apparatus.

32. A method in accordance with claim 31 comprising receiving a request for delivery of the stored media program via a computer network.

33. A method in accordance with claim 32 comprising transmitting the stored media program to the client via the computer network.

ABSTRACT OF THE DISCLOSURE

A method and apparatus for receiving requests for the remote storage of time schedule media programs from a client over the Internet and the delivery of such media programs in a specified streaming video format to the client is disclosed. The client requests the recording of a media program by a delivery device which delivery device identifies, in an e-mail message to the client, the storage location of the requested program in the delivery system. The client then accesses the delivery system via the Internet using the storage location identity and the delivery system delivers the stored program. The method and apparatus receives media program signals from distributed geographic locations to provide the client access to media programs not available at the client's location. Tools are also provided to simplify media program selection and storage.

Fig 1

Fig 2
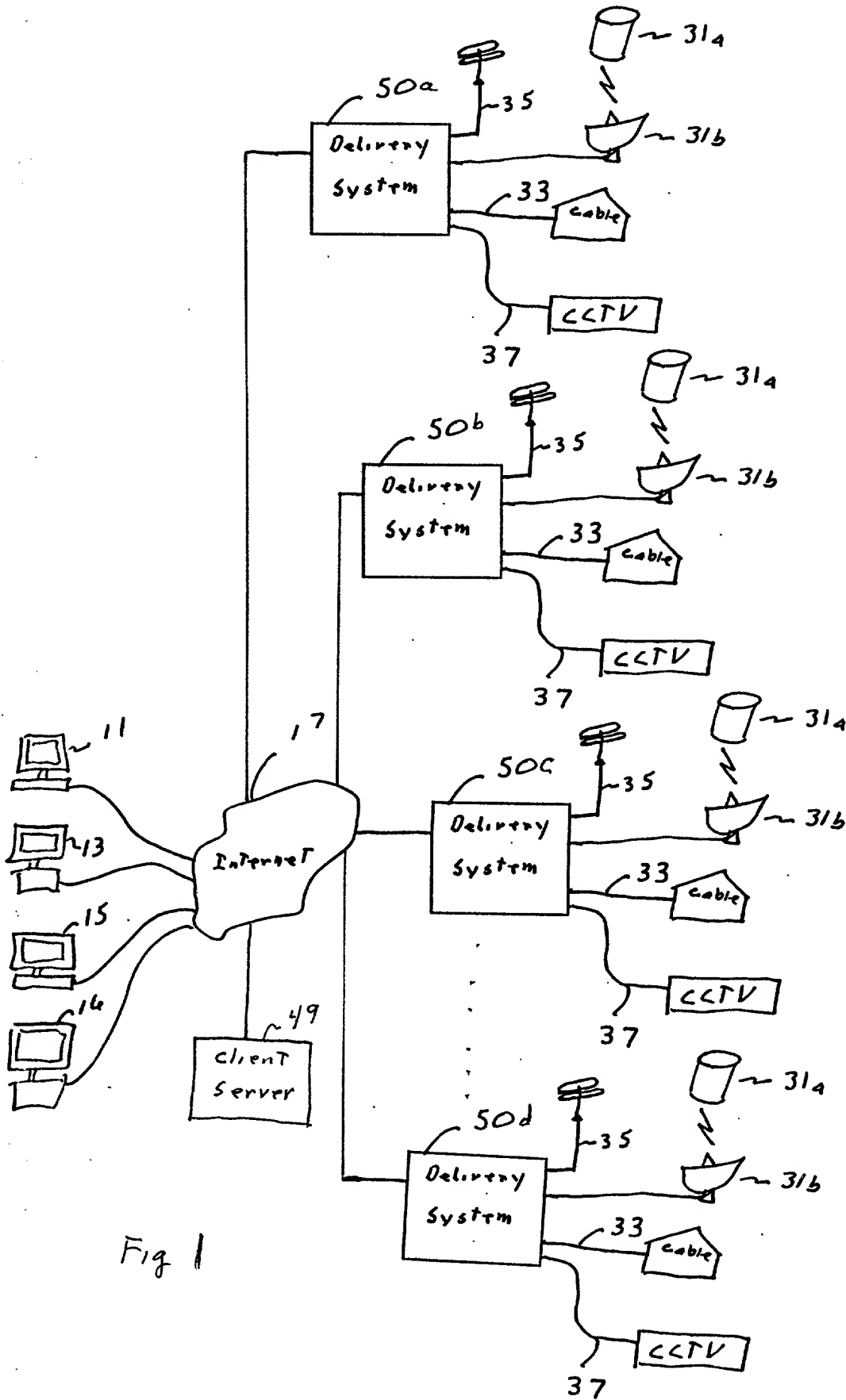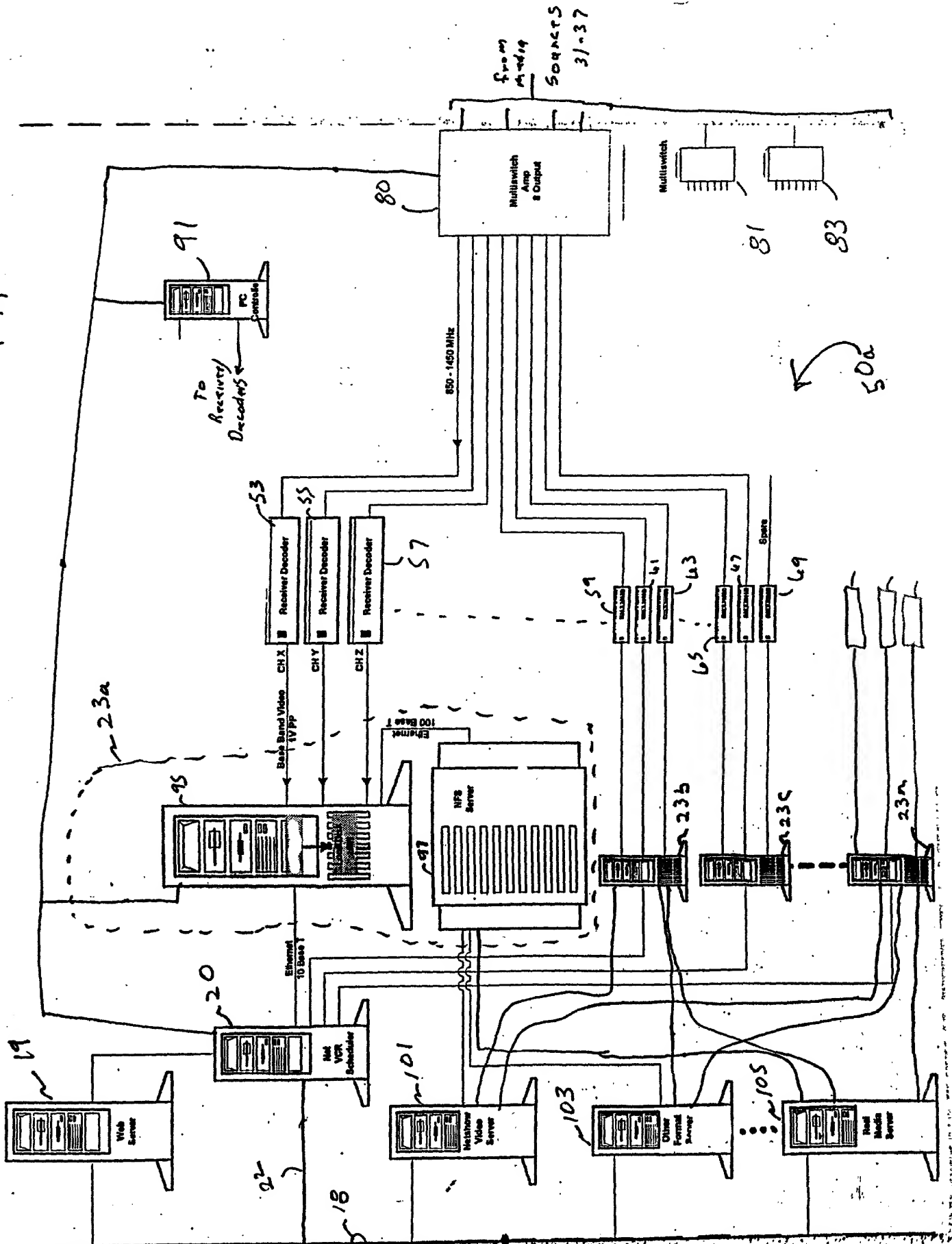
First Name 107   Last Name

Address

E Mail 101

Password 103   Confirm 105

Connect Type 109   Speed 111

Video Type 112   Time Zone 114

Payment Info. 113   Pin 115

☐ Accept
117

Preferred Listing
NEW YORK ▽
CHICAGO ◀
HELSINKI
PARIS ▼
102

Requested Service

Grade 118

Duration 119

Fig 3

Storage

my _____ | About | Help
August 18, 1999
4:35

Search
208

Record
217

Genre
206

TV Grid - New York, NY - 10024

205

TV Listings
204
Wed. Aug 18
7 pm - 10 pm
203
Broadcast
202
All Categories
209

Broadcast | Basic | Premium | Pay-Per-View | Satellite

Wednesday, August 18, 7:00PM EDT
edit

Other Listing
207

	7:00pm	7:30pm	8:00pm	8:30pm	9:00pm	9:30pm >>
2 WCBS		Hollywood		Martial Law (R, new)		Gone in the Night ***»
4 WNBC				The Frishman ** Suspense-comedy, 1996 R (cc)		Videos #2 (R, new, cc)
5 WNYW	The Simpsons	The Simpsons	The Wheel	Two Guys	MH Game	Drew Carey	Two Guys
7 WABC	Jeopardy!	Wheel	7 Days (1/2) (R, cc)		Star Trek: Voyager (R)
9 WWOR	Sister	Martin #100				
11 WPIX	Friends	Frasier	Dawson's Creek (R, new)		Charmed #4398002 (R, cc)

201

Internet

Fig 4

my iTape | About | Help
August 18, 1999

4:35

The Simpsons - WNYW Wed Aug 18 7:00PM

Record

RETURN

2/1

2/0

Comedy Situation Animated (30 minutes)

All Singing, All Dancing, episode #5F24 (CC, Stereo: TVPG)
Homer learns the video he rented is a musical; Marge and Lisa chase away his blues.

Add series to favorites

Actors: Dan Castellaneta, Julie Kavner, Nancy Cartwright, Yeardly Smith, Harry Shearer, Hank Azaria
Executive producers: James L. Brooks, Matt Groening, David Mirkin

Future Episodes
Homer Badman, episode #2F06 Wed Aug 18 7:30PM
A Fish Called Selma, episode #3F15 Thu Aug 19 7:00PM
Summer of 4'2'', episode #3F22 Thu Aug 19 7:30PM
Raging Abe Simpson, episode #3F19 Fri Aug 20 7:00PM

Also see the episode guide

Internet

FIG 5

Page 5

FIG 6

Your program is ready! - Microsoft Exchange

From To John Client

Your program is ready! *TVStorage.net* has recorded the following television program.

The Simpsons
Wednesday, August 18th, 1999
7:00 PM - 7:30 PM
WYNY - Channel 5

TVStorage Client T TV Storage

To watch it, click here: http://www.____.net/account=____ @____.com:program=BZD1TRY3
This program will be available until Wednesday, August 25th, 1999, at which time it will be automatically erased.

TVStorage

To record additional programs, click here: http://www.____.net/account=____ @____.com
Thank you for using ____.net. *Client Watson*

TVStorage

Please visit our ____.net sponsor of the day.
TVStorage

To John Client

FIG 7

TVStorage

⊠ Your program is going to be erased! -

From:

Your program is going to be erased! The television program that you recorded is going to be erased in 24 hours.
You will not be able to watch it after Wednesday, August 25, 1999, 8:00 PM EST.

The Simpsons
Wednesday, August 18th, 1999
7:00 PM - 7:30 PM
WYNY - Channel 5

To watch it, click here: http://www._____TVStorage_____.net/account=_____@_____TVStorage_____.com.program=BZD1TRY3

To purchase a 1 week extension for $1.95, click here: http://www._____.net/account=_____@_____.com
Thank you for using _____TVStorage_____.net.

613

Please visit our _____TVStorage_____.net sponsor of the day.
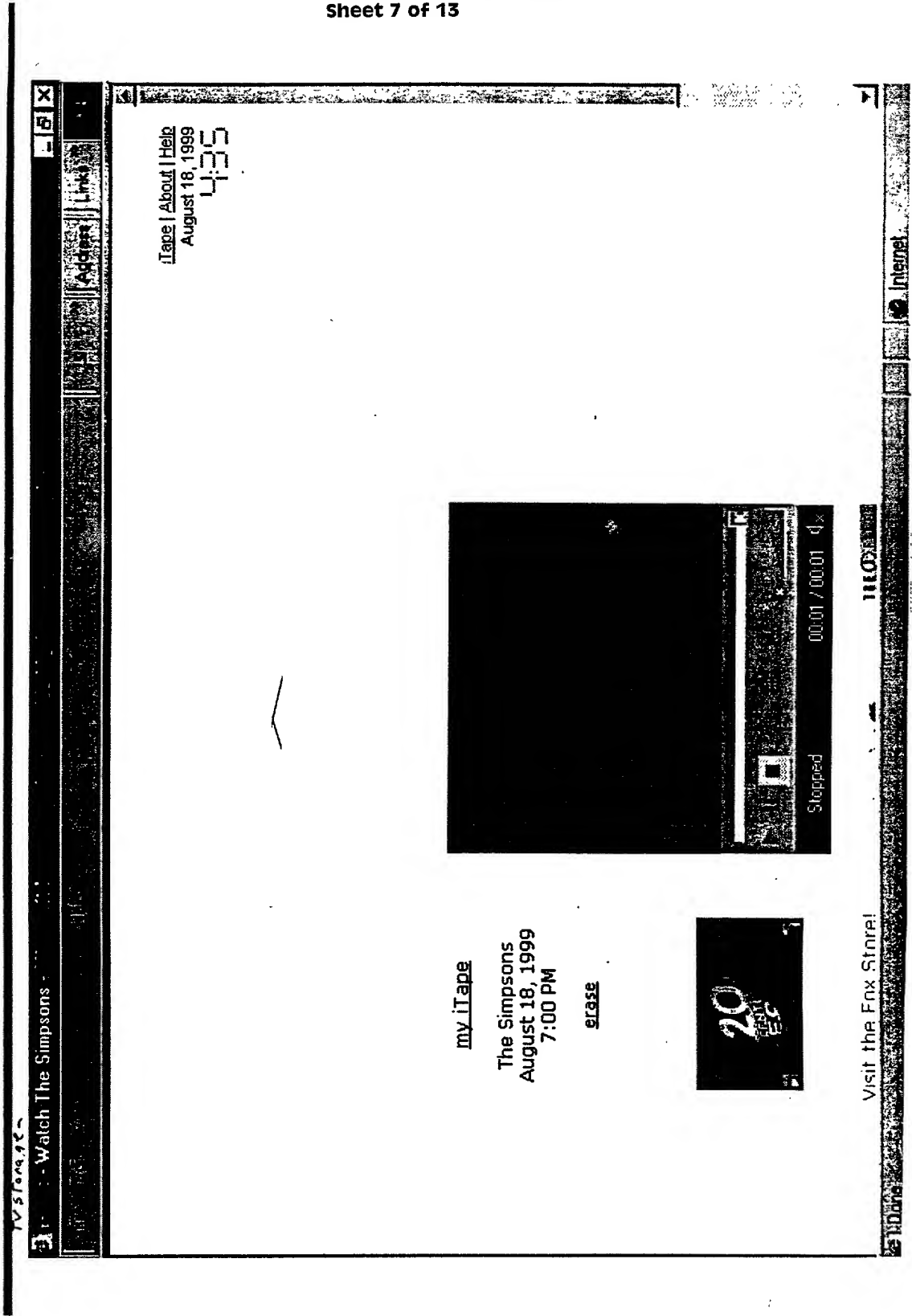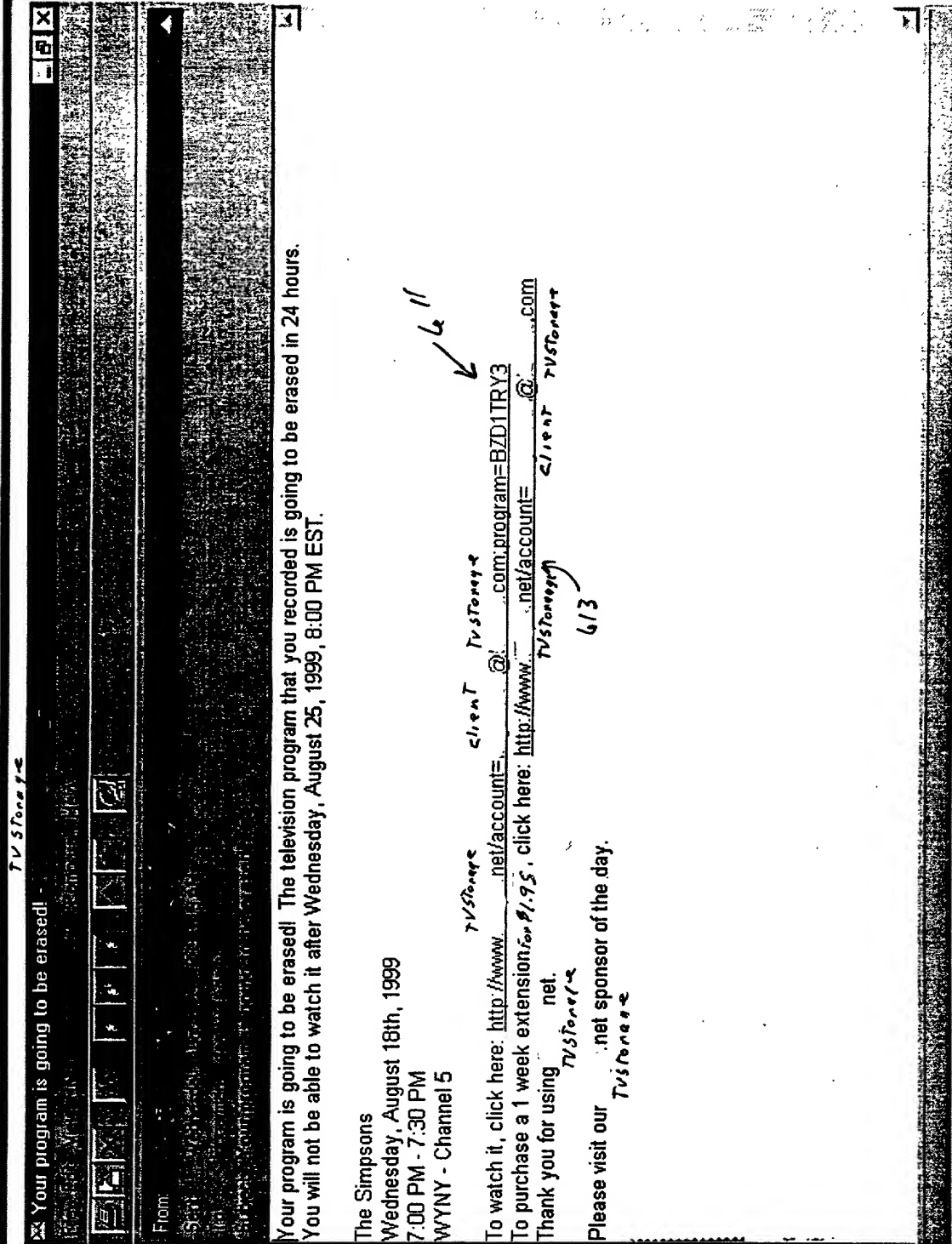
FIG-8

my Home | About | Help

August 18, 1999

4:35

My TVStorage: You have 30 minutes of unused TVStorage. Click here to buy more.

603 → 405 → 607 →

Recorded Time	Program	Date/time recorded; expires	Actions
30 minutes	The Simpsons	8/14/99, 7:00 expires in 3 days	watch, extend, erase
1 hour	NYPD Blue	8/16/99, 10:00 expires in 5 days	watch, extend, erase
30 minutes	unused	unused	record

Done   Internet

FIG 9

Client Contact — 501

Member Validation — 505

Non-Member

SEND Membership Screen — 537

Receive Membership Data — 539

Validate — 541

Set up Member File — 543

Write Member Cookie — 545

Send Program Request Screen — 507

Receive Request Data — 509

Send Data to Scheduler — 511

Assign Needed Equipment — 513

Set Storage Routine for Media Start — 515

Execute Storage Routine — 517

Fig 10

Begin

Connect Source To Receiver ～521

Set up Receiver ～523

Instruct Digitizer ～525

File Address from Digitizer ～527

Time for Scheduled Program End ～529

Remove Connect Stop Encoding ～531

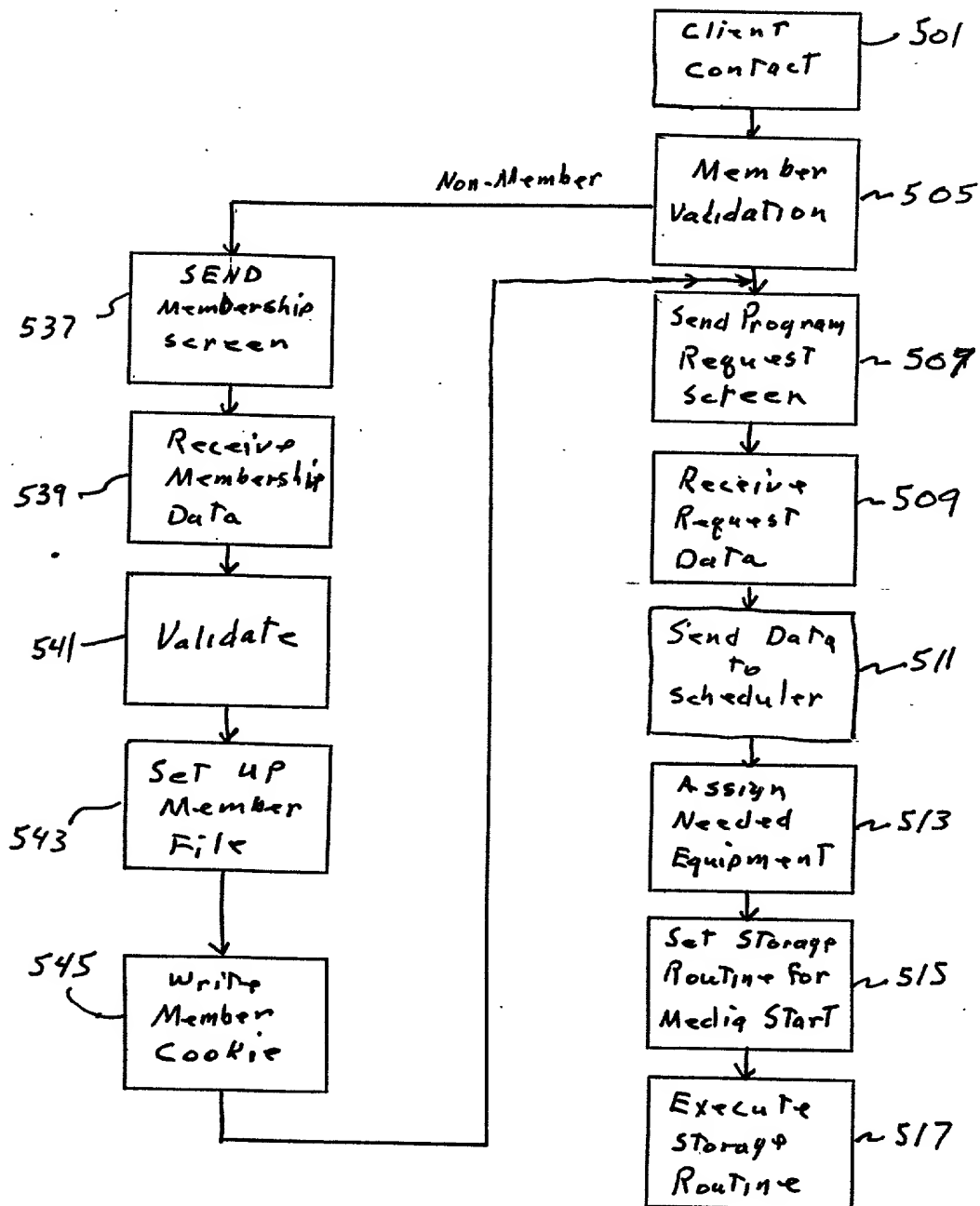Identify Playback Server and File ～533
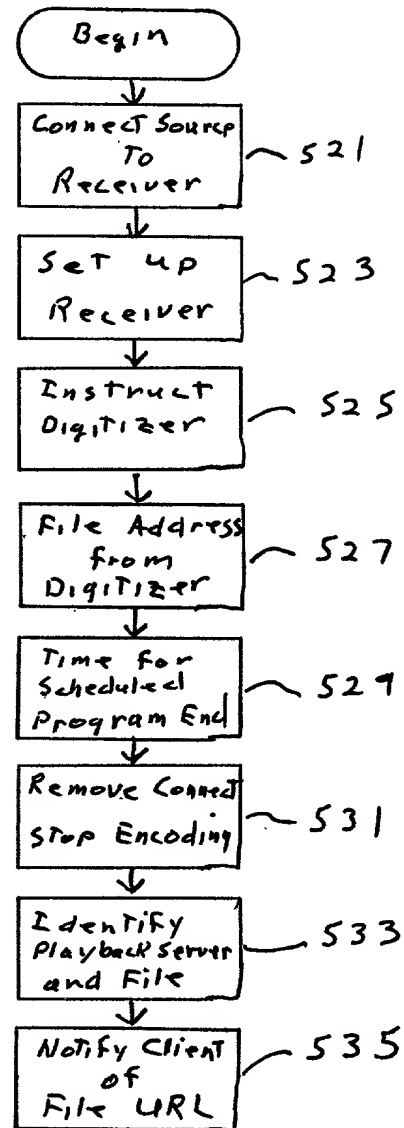
Notify Client of File URL ～535

Fig 11

You have requested program
storage requiring 1 hour of storage
and you only have 30 minutes
of storage available.

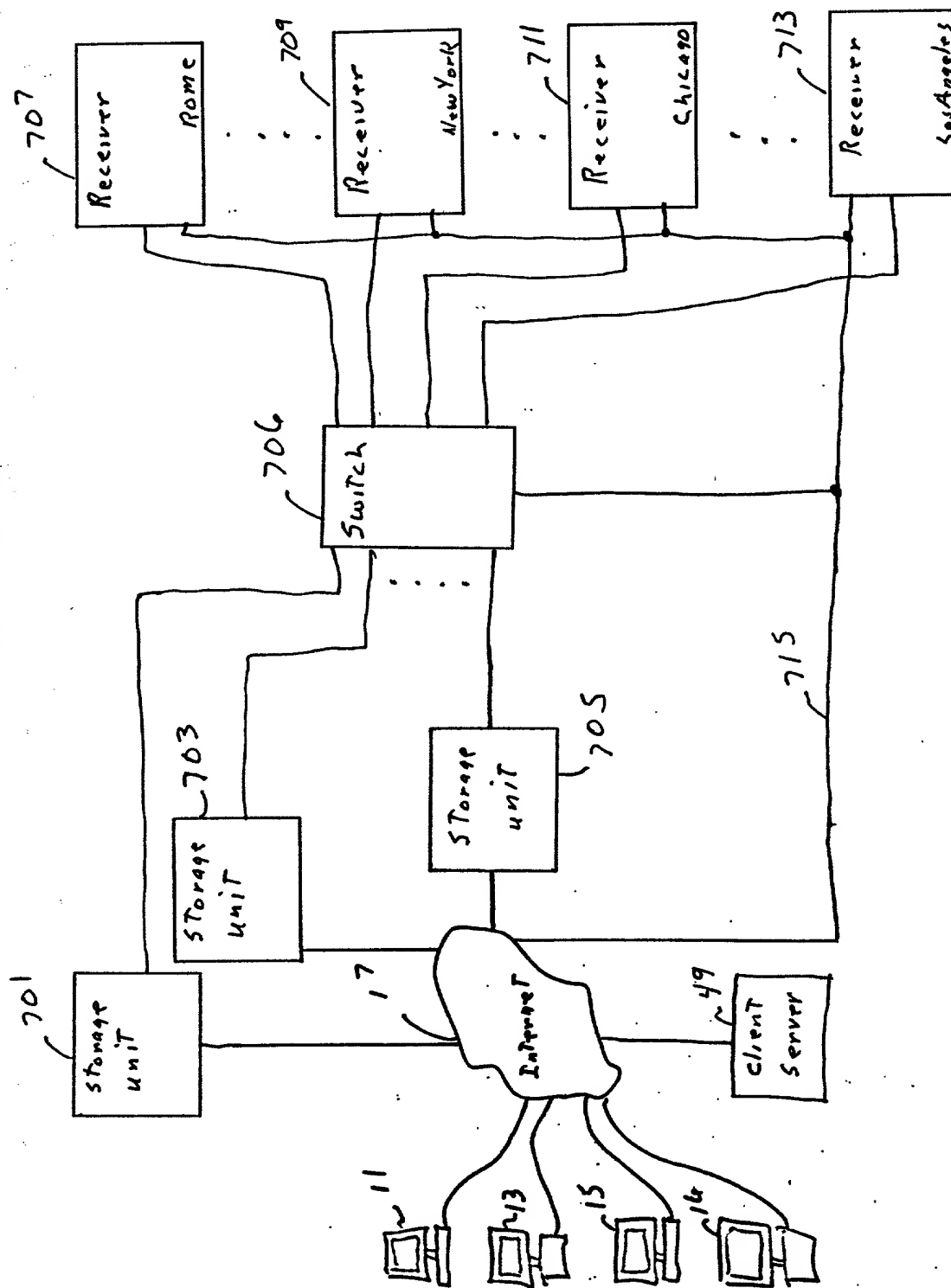Click here To buy More

601

Fig 12

Fig 13

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Declaration and Power of Attorney

As the below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject application for which a patent is sought on the invention entitled

METHOD AND APPARATUS FOR REMOTE AUDIOVISUAL SIGNAL RECORDING SERVICE

the specification of which *is attached hereto.*

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by an amendment, if any, specifically referred to in this oath or declaration.

I acknowledge the duty to disclose all information known to me which is material to patentability as defined in Title 37, Code of Federal Regulations, 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

None

I hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

None

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) with full power of substitution and revocation, to prosecute said application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent and Trademark Office connected therewith:

Lester H. Birnbaum	(Reg. No. 25830)
Richard J. Botos	(Reg. No. 32016)
Jeffery J. Brosemer	(Reg. No. 36096)
Kenneth M. Brown	(Reg. No. 37590)
Craig J. Cox	(Reg. No. 39643)
Donald P. Dinella	(Reg. No. 39961)
Guy Eriksen	(Reg. No. 41736)
Martin I. Finston	(Reg. No. 31613)
James H. Fox	(Reg. No. 29379)
William S. Francos	(Reg. No. 38456)
Barry H. Freedman	(Reg. No. 26166)
Julio A. Garceran	(Reg. No. 37138)
Mony R. Ghose	(Reg. No. 38159)
Jimmy Goo	(Reg. No. 36528)
Anthony Grillo	(Reg. No. 36535)
Stephen M. Gurey	(Reg. No. 27336)
John M. Harman	(Reg. No. 38173)
Michael B. Johannesen	(Reg. No. 35557)
Mark A. Kurisko	(Reg. No. 38944)
Irena Lager	(Reg. No. 39260)
Christopher N. Malvone	(Reg. No. 34866)
Scott W. McLellan	(Reg. No. 30776)
Martin G. Meder	(Reg. No. 34674)
John C. Moran	(Reg. No. 30782)
Michael A. Morra	(Reg. No. 28975)
Gregory J. Murgia	(Reg. No. 41209)
Claude R. Narcisse	(Reg. No. 38979)
Joseph J. Opalach	(Reg. No. 36229)
Neil R. Ormos	(Reg. No. 35309)
Eugen E. Pacher	(Reg. No. 29964)
Jack R. Penrod	(Reg. No. 31864)
Daniel J. Piotrowski	(Reg. No. 42079)
Gregory C. Ranieri	(Reg. No. 29695)
Scott J. Rittman	(Reg. No. 39010)
Eugene J. Rosenthal	(Reg. No. 36658)
Bruce S. Schneider	(Reg. No. 27949)
Ronald D. Slusky	(Reg. No. 26585)
David L. Smith	(Reg. No. 30592)
Patricia A. Verlangieri	(Reg. No. 42201)
John P. Veschi	(Reg. No. 39058)
David Volejnicek	(Reg. No. 29355)
Charles L. Warren	(Reg. No. 27407)
Jeffrey M. Weinick	(Reg. No. 36304)
Eli Weiss	(Reg. No. 17765)

I hereby appoint the attorney(s) on ATTACHMENT A as associate attorney(s) in the aforementioned application, with full power solely to prosecute said application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent and Trademark Office connected with the prosecution of said application. No other powers are granted to such associate attorney(s) and such associate attorney(s) are specifically denied any power of substitution or revocation.

Full name of sole inventor (or 1st joint inventor): **Adam W. Fingerman**

Inventor's
signature_____Date_____

Residence: Princeton, New Jersey

Citizenship: U.S.A.

Post Office Address: 418 Sayre Drive
                                    Princeton, NJ 07540

Full name of 2nd joint inventor: **Sitarama S. Kocherlakota**

Inventor's
signature_____Date_____

Residence: Naperville, Illinois USA

Citizenship: India

Post Office Address: 2707 Fairhauser Road
                                    Naperville, IL 60564 USA

Full name of 3rd joint inventor): **Franklin B. Rimalovski**

Inventor's
signature_____Date_____

Residence: Maplewood, New Jersey

Citizenship: U.S.A.

Post Office Address: 24 Euclid Avenue
                                    Maplewood, NJ 07040

ATTACHMENT A

Attorney Name(s):   <u>Kenneth H. Samples</u>   Reg. No.:   <u>25,747</u>

<u>Robert J. Fox</u>   Reg. No.:   <u>27,635</u>

<u>Perry J. Hoffman</u>   Reg. No.:   <u>37,150</u>

<u>Timothy E. Levstik</u>   Reg. No.:   <u>30,192</u>

Telephone calls should be made to **Fitch, Even, Tabin & Flannery** at:
Phone No.:   <u>(312) 577-7000</u>
Fax No.:   <u>(312) 577-7007</u>

All written communications are to be addressed to:

Fitch, Even, Tabin & Flannery
120 North LaSalle Street, Suite 1600
Chicago, IL 60603-3406